REMARKS

Reexamination and reconsideration of this application in view of the amendment to the claims and the following remarks is respectfully requested. By this amendment, claims 1, 11, 25, and 29 are amended, and claim 32 is canceled. No new claims are added and no new matter is added. After this amendment, claims 1-9, 11-21 and 23-31, and 33 remain pending in this application.

Claim Rejections - 35 USC §112

The Examiner rejected claims 5 and 11 under 35 USC §112 stating that:

> [the claim language of] and wherein the fluorocarbon (or hydrocarbon) constituent of the gas facilitates the reaction of the nitrogen with the plasma," does not appear to clearly recite the subject matter of applicant's invention, as recited in p. 8, line 29 to p. 9, line 14 of applicant's specification. According to the subject matter recited in p. 8, line 29 to p. 9, line 14, it appears that the gas generates the plasma and does not facilitate the reaction. Furthermore, the composition in the plasma, which is CF4 or CH4, facilitates the reaction of the host plasma with the nitrogen, which is a constituent of the air.
>
> On the other hand, based on the recited language in claims 5 and 11, it appears to convey that three separate components (gas, plasma, and air) are producing the at least one predetermined compound. For this reason, examiner recommends amending the recited language in claims 5 and 11 to clearly convey the subject matter recited in p. 8, line 29 to p. 9, line 14 of applicant's specification.

Claim 5 (and claim 11) recites:

> The method according to claim 3, wherein the air includes nitrogen, wherein the at least one predetermined compound results from a reaction of nitrogen with the plasma, and wherein the fluorocarbon constituent of the gas facilitates the reaction of the nitrogen with the plasma.

The Applicants respectfully suggest that the Examiner is misreading claims 5 and 11. The Applicants disagree with the Examiner that claim 5 and 11 are reciting "that three separate components (gas, plasma, and air) are producing the at least one predetermined compound". For example, claim 5 (and 11) explicitly states:

1.) wherein the air includes nitrogen

2.) wherein the at least one predetermined compound results from a reaction of nitrogen with the plasma

3.) and wherein the fluorocarbon constituent of the gas facilitates the reaction of the nitrogen with the plasma

As can be seen, claim 5 (and 11) clearly recites that the predetermined compound results from a reaction of nitrogen with the plasma and not by the combination of gas, plasma, and air as alleged by the Examiner. This language of claim 5 (and 11) is consistent with page 8, line 29 to page 9, line 14 of the Specification as originally filed, which states:

> The host plasma is fluorocarbon or hydrocarbon based (i.e., it is generated from a gas including a compound with the general formula CxHyFz, wherein x,y,z are integer with x>=1 and y,z>=0); preferably, the host plasma includes CF_4 or CH_4. This composition facilitates the reaction of the host plasma with the constituents of the air, and particularly with nitrogen (N_2); the reaction results in the generation of one or more compounds (such as CN) featuring a very high intensity of their characteristic emission peaks.

Accordingly, the Applicants respectfully suggest that the rejection of claims 5 and 11 under 35 U.S.C. §112 has been overcome and should be withdrawn.

Claim Rejections - 35 USC §102

Reconsideration of the rejection of claims 1-9, 11-21, 23-31, and 33 under 35 U.S.C. §102(a) as being anticipated by Singh et al., ("Singh", WO 02/23585), in light of Levinstein et al., ("Levinstein", US 4,256,534) and Kyotani (US 6,409,802) is respectfully requested in view of the amendments to independent claims 1, 11, 25, and 29, and for the following reasons.

Singh et al. (WO02/23585) relates to a process for etching a wafer (see page 4, lines 19-26 of Singh). The method disclosed in Singh is aimed at detecting the completion of an etching process. In contrast with the Applicants' invention, in the method of Singh, the test is (for detecting any leak of air into the reactor) is performed when a wafer **is loaded** in the reactor. For this purpose, the species relating to the etching process are monitored, so as to identify the completion of the etching process, which occurs when the species disappear (see page 5, lines 2-

6 of Singh). Singh uses the same method for detecting any leak of air into the reactor. Indeed, Singh points out that, in the presence of air, the corresponding foreign species react with the plasma thereby modifying its intensity. This change, which occurs at the start of the pumping cycle of one of the load locks, can be detected by monitoring the same species as above (see page 5, lines 7-15 of Singh). In Singh, species that were already present in the plasma are monitored (not new ones that were not present in the plasma). Moreover, in sharp contrast with the Applicants' invention, Singh detects a short dip in the plasma intensity, i.e., a reduction that is only transient (and not a steady increase of the concentration of the new constituent).

The Applicants respectfully ask the Examiner to pay careful attention to the fact that Singh is only directed toward a method for identifying leaks within a reactor when a wafer is in the main chamber of the reactor. The Applicants also respectfully ask the Examiner to pay close attention to the fact that Singh is directed at monitoring ionic species such as F, N, and N that are produced from the etching process to determine if a leak has occurred.

The presently claimed invention, on the other hand, now more clearly recites:

> *prior to establishing a plasma inside a chamber of a reactor and without a wafer in the chamber, removing nitrogen-based compounds from the chamber of the reactor and maintaining an atmosphere in the chamber;*
>
> *establishing, without a wafer in the chamber, a plasma inside the chamber of the reactor, the plasma being configured with a composition suitable to generate at least one predetermined compound when reacting with at least one air constituent, wherein the predetermined compound is indicative of an air leak into the chamber,*
>
> *detecting, without a wafer in the chamber, a light emission of the plasma inside the chamber, and*
>
> *analyzing the light emission to identify the presence of the at least one predetermined compound having been generated from a reaction with at least one air constituent in the chamber from an air leak into the chamber.*

Support for these amendments can be found in the Specification as originally filed at FIGs. 3A-3B and paragraphs 34-38 of the Pre-Grant Publication 20050037500.

As can be seen, the method of the presently claimed "removing...establishing...detecting" are performed "without a wafer in the chamber". Singh, on the hand, explicitly teaches that a wafer

is within the chamber during the process taught by Singh. For example, Singh at page 4, lines 21-32 to page 5, lines 1-8 states:

> While the wafer substrate 150 is in the main chamber 120, the main chamber 120 is pumped down. Load lock110 is released to atmospheric pressure and another substrate 150 is loaded therein. Having stabilized, the main chamber 120 has its etch process initiated. During etch, the wafer substrate 150 in the load lock 110 is brought down to vacuum conditions. If a leak is present in the load lock110 or entrance door 115 from the load lock 110 to the main chamber 120, or in the exit door 125 from the main chamber 120 and the load lock 130, there is a pressure change in the main chamber 120. The monitor device 140 senses a change in plasma intensity corresponding to the pressure change in the main chamber 120. The change in plasma intensity manifests itself as short dip (i. e., a flicker) in a plot of plasma intensity v. time in etch.
>
> [...]
>
> The same endpoint detection system may also be used to tell whether the chamber exhibits a leak during process.

As can be seen, Singh clearly teaches that a wafer is within the main chamber when the process of Singh is performed. Accordingly, the presently claimed invention distinguishes over Singh for at least this reason.

The Examiner on page 3 of the present Office Action states:

> prior to establishing a plasma inside a chamber of a reactor, removing nitrogen-based compounds from the chamber of the reactor (i.e. removing atmospheric pressure (i.e. nitrogen-based compounds) from the chamber, p. 4, lines 4-3 1)

However, the "removing atmospheric pressure" referred to by the Examiner is teaching that a vacuum is created. For example, Singh teaches:

> Contamination control is enhanced in that the load locks help keep the main chamber at vacuum conditions at all times. The load locks receive/transfer wafers to and from the main chamber. In turn they cycle their pressure from atmospheric to vacuum conditions during the process.

Therefore, Singh is not maintaining an atmosphere within the main chamber. The presently claimed invention, on the other hand, now more clearly recites:

> *prior to establishing a plasma inside a chamber of a reactor and without a wafer in the chamber, removing nitrogen-based compounds from the chamber of the reactor and maintaining an atmosphere in the chamber*

In other words, the present invention does not create a vacuum, but removes nitrogen-based compounds from the chamber and maintains an atmosphere. Accordingly, the presently claimed invention distinguishes over Singh for at least this reason as well.

The Examiner states on pages 3-4 of the present Office Action:

> establishing a plasma inside a reactor, the plasma having a composition suitable to generate at least one predetermined compound when reacting with air; detecting a light emission of the plasma; and analyzing the light emission to identify the presence of the at least one predetermined compound. (i.e. p. 3, line 25 to p. 5, line 15). Singh further teaches the following regarding before establishing the plasma inside the reactor: processing at least one wafer of semiconductor material and removing the least one wafer from the reactor; and the air includes nitrogen, the at least one predetermined compound (i.e. CN) resulting from the reaction of nitrogen with the plasma. (i.e. p. 4, line 4 to p. 5, line 6).

The Applicants respectfully suggest that the Examiner is mischaracterizing Singh. For example, Singh, at page 5, lines 1-31, explicitly states (emphasis added):

> The optical signal is converted to an electrical signal and magnified and read by an Op Amp circuit and then sent to analog-to-digital (A/D) converter circuit. Since a signal depends on presence of a type of species in the chamber, its absence at the completion of the process will reduce the signal intensity and hence trigger the end of the process. For example, in a silicon nitride etch, the ionic species monitored include F, CN, and N. The wavelengths monitored are 704,387, and 674nm, respectively.
>
> The same endpoint detection system may also be used to tell whether the chamber exhibits a leak during process. Owing to a leak in the chamber, plasma intensity will change. A leak means foreign species, 02 and N2 for example, have been introduced into the chamber. The foreign species modify (due to reaction with process gases) the intensity of the wavelengths being monitored. This presents at the detector output as change in intensity that can be used to indicate the leak in the chamber. This change in intensity, if found, occurs at start of pumping cycle of one of the load locks. The presence of leak can be readily detected. Processing is halted and repairs performed. Wafers have not been processed incorrectly.
>
> [...]

> The endpoint detection method discussed herein makes use of intensity variation due to partial pressure changes (concentration of a gas).

As can be seen, Singh teaches monitoring for ionic species already present in the chamber. In other words, F, CN, and N are already present in the chamber and their wavelengths are being monitored for dips due to pressure changes.

The presently claimed invention, on the other hand, now more clearly recites:

> *establishing, without a wafer in the chamber, a plasma inside the chamber of the reactor, the plasma being configured with a composition suitable to generate at least one predetermined compound when reacting with at least one air constituent, wherein the predetermined compound is indicative of an air leak into the chamber*

As can be seen, the plasma of the presently claimed invention is purposefully configured so that a new predetermined compound is generated when reacting with at least one air constituent. This new predetermined compound is indicative of an air leak into the chamber. Stated differently, a host plasma with a specific composition adapted to facilitate its reaction with constituents of the air (such as N_2) is purposefully established in the empty reactor. The plasma is then monitored for the appearance of a new constituent (such as CN), which was not present in the original composition of the plasma, but that may be generated in the presence of air in the reactor as a result of its reaction with the plasma (see paragraphs 0035-0039 of the Pre-Grant Publication). As discussed above, an ionic species such as CN already exists within the chamber and Singh only monitors the pressure changes when O_2 or N_2 is introduced into the chamber. In other words, Singh clearly does not teach that the plasma is configured so that a new predetermined compound is created when air is leaked into the chamber. Accordingly, the presently claimed invention distinguishes over Singh for at least these reasons as well.

Furthermore, the method of Singh is far less accurate than the Applicants' invention (see the paragraphs that begin at page 12, line 13; and page 12, line 16 of Applicants' specification). Indeed, the monitoring of the plasma being used during the etching process – as disclosed in Singh – does not allow achieving the desired result in any situation. For example, consider a leak of air that is present in the reactor before starting the etching process. In this case, no dip in

the plasma intensity is experienced; therefore, the method of Singh would be completely ineffective in detecting the corresponding leak of air.

Also, Singh, Levinstein, or Kyotani either individually or in combination thereof fail to teach or suggest the presently claimed:

> *prior to establishing a plasma inside a chamber of a reactor and without a wafer in the chamber, removing nitrogen-based compounds from the chamber of the reactor and maintaining an atmosphere in the chamber;*
>
> *establishing, without a wafer in the chamber, a plasma inside the chamber of the reactor, the plasma ~~having~~ being configured with a composition suitable to generate at least one predetermined compound when reacting with at least one air constituent, wherein the predetermined compound is indicative of an air leak into the chamber,*
>
> *detecting, without a wafer in the chamber, a light emission of the plasma inside the chamber, and*
>
> *analyzing the light emission to identify the presence of the at least one predetermined compound having been generated from a reaction with at least one air constituent in the chamber from an air leak into the chamber.*

The Applicants respectfully remind the Examiner that proper a 35 U.S.C. § 102(a) rejection requires that Singh (and Levinstein and Kyotani) teach (i.e., identically describe) each and every element of the rejected claims, which, as discussed above, Singh (and Levinstein and Kyotani fail to do.[1] Accordingly, the presently claimed invention distinguishes over Singh (Singh (and Levinstein and Kyotani) for at least this reason as well. The Applicants respectfully submit that the Examiner's rejection of independent claims 1, 13, 25, and 29 under 35 U.S.C. § 102(a) has been overcome and should be withdrawn.

Furthermore, claims 2-9, 11-12, 14-21, 23-24, 26-28, 30-31, and 33 depend upon amended independent claims 1, 13, 25, and 29, respectively, and because dependent claims recite all the

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[1] See MPEP §2131 (Emphasis Added) "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). "The identical invention must be shown in as complete detail as is contained in the ... claim."

limitations of the independent claim, it is believed, for this additional reason, that dependent claims 2-9, 11-12, 14-21, 23-24, 26-28, 30-31, and 33 also recite in allowable form.

Accordingly, in view of the remarks above, in view of the amendments to claims 1, 13, 25, and 29, and because the Singh, Levinstein, and Kyotani, or any combination thereof, do not teach, anticipate, or suggest the presently claimed invention, the Applicants believe that the rejection of claims 1-9, 11-21, 23-21, and 33 under 35 U.S.C. §102(a) has been overcome. The Examiner should withdraw the rejection of these claims.

Claim Rejections - 35 USC §103

Reconsideration of the rejection of claims 1-9, 11-21, and 23-33 under 35 U.S.C. §103(a) as being anticipated by Sui ("Sui", WO 00/03421) is respectfully requested in view of the amendments to claims 1, 13, 25, and 29, and for the following reasons.

Sui (WO00/03421) relates to a method for detecting the endpoint of etching processes (see page 1, lines 8-9, page 3, lines 17-20, and page 16, lines 18-21). Sui monitors the intensity of the radiation at predefined wavelengths that vary during different stages of the etching process, so as to allow detecting the desired endpoints (see page 19, lines 1-4). If a radiation change (indicating the endpoint) occurs at the same time as an abnormal change in a "process condition signal", a fault endpoint is detected (see page 19, lines 5-10). A generic "helium leak rate" is the only process condition that is listed in Sui among the conditions listed at page 18, lines 6-11 of Sui.

With respect to the claim element of:

> *establishing a plasma inside the chamber of the reactor, the plasma having a composition suitable to generate at least one predetermined compound when reacting with air,*

the Examiner directs the Applicant to page 16, line 16 to page 18, line 35 of Sui.

However, Sui is only teaching an endpoint detection process where "one of more compositions of process gas comprising etchant gas for etching the substrate 20 are introduced into the chamber 42 through the gas distributor". Sui gives a list of etchant gases such as O_2 and N_2 that are purposely released into the chamber. This clearly shows that Sui is not focusing on detecting air leaks and that Sui does not teach "*establishing, without a wafer in the chamber, a plasma inside the chamber of the reactor, the plasma being configured with a composition suitable to generate at least one predetermined compound when reacting with at least one air constituent, wherein the predetermined compound is indicative of an air leak into the chamber*". Furthermore, throughout the disclosure, Sui teaches that a wafer is within the chamber. Accordingly, the presently claimed invention distinguishes over Sui for at least these reasons.

The Examiner also states on page 8 of the present Office Action:

> While Sui teaches having process gas control instruction sets that control the composition and flow rates of process gas supplied into the chamber, Sui does not specifically teach the following step: "prior to establishing a plasma inside a chamber of a reactor, removing nitrogen-based compounds from the chamber of the reactor." It would have been obvious to a person of ordinary skill in the art to modify Sui's detection method by removing nitrogen-based compounds from the chamber of the reactor before establishing a plasma inside a chamber of a reactor because Sui teaches that a user has the ability to control what is being introduced and removed from the chamber(s) and Sui recognizes that the process (i.e. etching process) can be performed in multiple stages, for example, each stage having different process conditions (i.e. p. 13, line 9 to p. 14, line 32; and p. 16, lines 18-34).

However, the Applicants respectfully suggest that the Examiner is improperly reading Sui beyond the scope of its teachings. For example, page 13, line 9 to page 14, line 32; and page 16, lines 18-34 of Sui are completely silent on removing nitrogen-based compounds. Sui only teaches controlling gas flow into the chamber by valves. Accordingly, the presently claimed invention distinguishes over Sui for at least these reasons as well.

As can be seen from the above discussion, Sui does not teach or suggest the presently claimed:

> *prior to establishing a plasma inside a chamber of a reactor and without a wafer in the chamber, removing nitrogen-based compounds from the chamber of the reactor and maintaining an atmosphere in the chamber;*

> *establishing, without a wafer in the chamber, a plasma inside the chamber of the reactor, the plasma ~~having~~ being configured with a composition suitable to generate at least one predetermined compound when reacting with at least one air constituent, wherein the predetermined compound is indicative of an air leak into the chamber,*
>
> *detecting, without a wafer in the chamber, a light emission of the plasma inside the chamber, and*
>
> *analyzing the light emission to identify the presence of the at least one predetermined compound having been generated from a reaction with at least one air constituent in the chamber from an air leak into the chamber.*

Accordingly, the Applicants suggest that the rejection of claims 1-9, 11-21, and 23-33 under 35 U.S.C. §103(a) as being anticipated by Sui ("Sui", WO 00/03421) has been overcome and should be withdrawn.

The Examiner rejected claims 1-3, 13-15, 25-26, and 29-30 under 35 U.S.C. 103(a) as being unpatentable over Zajac (U.S. Patent No. 4,857,136).

As stated in the previous Response With Amendment, Zajac mainly relates to the detection of the end of an etching process (see col. 2, line 66 through col. 3, line 2). For this purpose, an additional chamber 26 is provided (see column 2, lines 26-45) even if the possibility of using the standard chamber 12 is not excluded (see column 3, lines 28-33). The ratio between the light emitted by two different components of the plasma is then monitored (see column 3, lines 2-10).

In addition to detecting the end of a process, Zajac also suggests the possibility of using the same solution for detecting air leaks during the above-mentioned etching process. Toward that end, Zajac simply suggests monitoring gases or other substances that change in ratio, without suggestion of the formation of new constituent due to the reaction with the air.

With respect to the claim element of:

> *prior to establishing a plasma inside a chamber of a reactor, removing nitrogen-based compounds from the chamber of the reactor*

the Examiner states on page 10 of the present Office Action:

> While Zajac teaches a detection method that involves removing gases from the chamber of the reactor (i.e. column 2, lines 6-18), detecting a number of conditions such as the starting point (i.e. of the plasma etching process), system cleanliness (i.e. reactor), air leaks, etc. (i.e. column 3, lines 11-28), Zajac does not specifically teach the step of removing nitrogen-based compounds from a chamber of a reactor. It would have been obvious to a person of ordinary skill in the art to specifically include nitrogen-based compounds as one of the gases to remove from a chamber of the reactor because it would be desirable to process semiconductor wafers in a vacuum-type of environment to insure that the finished wafers do not contain any extraneous compounds.

However, the presently claimed invention now more clearly recites:

> *prior to establishing a plasma inside a chamber of a reactor and without a wafer in the chamber, removing nitrogen-based compounds from the chamber of the reactor and maintaining an atmosphere in the chamber*

Therefore, the Examiner's argument of "it would be desirable to process semiconductor wafers in a vacuum-type of environment to insure that the finished wafers do not contain any extraneous" fails. Also, page 2, line 6 to column 3, line 28 of Zajac as cited by the Examiner is completely silent on "*establishing, without a wafer in the chamber, a plasma inside the chamber of the reactor, the plasma being configured with a composition suitable to generate at least one predetermined compound when reacting with at least one air constituent, wherein the predetermined compound is indicative of an air leak into the chamber*". Accordingly, the presently claimed invention distinguishes over Zajac for at least these reasons.

Furthermore, the Examiner is incorrect in stating that Zajac analyzes the light emission to identify the presence of the at least one predetermined compound. For example, Zajac merely states at col. 2, line 46 to col. 3, line 10:

> A pair of photodiodes 33, 34 are positioned outside the chamber for sensing the presence of two different gases in the chamber. The photodiodes can be manufactured to be responsive to light of the wavelengths which are characteristic of the gases to be detected, or they can be provided with filters which selectively pass light of the desired wavelengths. The photodiodes produce electrical signals corresponding to the amounts of light of the respective wavelengths impinging thereon.
>
> [...]

> By way of example, it is assumed that the reactor is being employed in a plasma etching process and that the condition to be detected is the end of the etching process. In this example, one of the photodiodes is responsive to the light emitted by excited chlorine molecules, and the other is sensitive to the light emitted by excited water molecules. The ratio of chlorine to water changes throughout the etching process, becoming lower as the process proceeds, and level detector 37 is set to provide an output signal when the ratio drops to the level corresponding to the end of the process.

This is not the same as:

> [...]
> *establishing, without a wafer in the chamber, a plasma inside the chamber of the reactor, the plasma being configured with a composition suitable to generate at least one predetermined compound when reacting with at least one air constituent, wherein the predetermined compound is indicative of an air leak into the chamber,*
> *detecting, without a wafer in the chamber, a light emission of the plasma inside the chamber, and*
> *analyzing the light emission to identify the presence of the at least one predetermined compound having been generated from a reaction with at least one air constituent in the chamber from an air leak into the chamber.*

Accordingly, the presently claimed invention distinguishes over Zajac for at least these reasons as well.

As can be seen from the above discussion, Zajac does not teach or suggest the presently claimed:

> *prior to establishing a plasma inside a chamber of a reactor and without a wafer in the chamber, removing nitrogen-based compounds from the chamber of the reactor and maintaining an atmosphere in the chamber;*
> *establishing, without a wafer in the chamber, a plasma inside the chamber of the reactor, the plasma being configured with a composition suitable to generate at least one predetermined compound when reacting with at least one air constituent, wherein the predetermined compound is indicative of an air leak into the chamber,*
> *detecting, without a wafer in the chamber, a light emission of the plasma inside the chamber, and*
> *analyzing the light emission to identify the presence of the at least one predetermined compound having been generated from a reaction with at least one air constituent in the chamber from an air leak into the chamber.*

Accordingly, the Applicants suggest that the rejection of claims 1-3, 13-15, 25-26, ad 29-30 rejected under 35 U.S.C. 103(a) as being unpatentable over Zajac (U.S. Patent No. 4,857136) has been overcome and should be withdrawn.

The Examiner also rejected claim 32 under 35 U.S.C. 103(a) as being unpatentable over Singh and in light of Levinstein and Kyotani, as applied to claims 1-9, 11-21, 23-31, and 33 above, and further in view of Powell et al. ("Powell," US 6256186).

Claim 32 has been canceled, thereby rendering the rejection of claim 32 moot. However, the subject matter of claim 32 has been incorporated into independent claims 1, 13, 25, and 29.

With respect to Powell, the Examiner states on page 11 of the present Office Action:

> Powell teaches an invention that consists of a semi-conductor wafer processing apparatus comprising a plasma etching reactor, an electrostatic chuck and control means for processing, e.g. etching, a wafer when it is on the platen and for etching when no wafer is present (i.e. column 2, lines 11-16). Powell further teaches that an oxygen and carbon tetrafluoride plasma is consequently run for 5 seconds or so immediately prior to the next wafer being loaded onto the surface (column 4, lines 27-34).

However, the presently claimed invention and Powell are directed at very different subject matter. For example, Powell is directed towards providing a more reliable clamping of wafers on an electrostatic chuck (see Powell at col. 1, lines 15-41). In particular, Powell teaches that an oxygen and carbon tetrafluoride plasma is run during the exchange of two different wafers for a short period of about 5 seconds. This step is used to remove any deposition on the platen of the chuck that would adversely affect the clamping of the wafers. In other words, this is a "cleaning process" of the chuck (see column 4, lines 19-34) and nowhere does Powell teach or even suggest a process for detecting air leaks within a chamber by monitoring the light emission of the plasma, and let alone any analysis thereof for whatever purpose. Furthermore, Powell explicitly teaches that a plasma comprising oxygen is run within the chamber. Therefore, Powell cannot teach *establishing, without a wafer in the chamber, a plasma inside the chamber of the reactor, the plasma being configured with a composition suitable to generate at least one predetermined*

compound when reacting with at least one air constituent, wherein the predetermined compound is indicative of an air leak into the chamber".

As can be seen from the above discussion, Powell individually or in combination with Singh and/or Levinstein and/or Kyotani do not teach or suggest the presently claimed:

> *prior to establishing a plasma inside a chamber of a reactor and without a wafer in the chamber, removing nitrogen-based compounds from the chamber of the reactor and maintaining an atmosphere in the chamber;*
>
> *establishing, without a wafer in the chamber, a plasma inside the chamber of the reactor, the plasma being configured with a composition suitable to generate at least one predetermined compound when reacting with at least one air constituent, wherein the predetermined compound is indicative of an air leak into the chamber,*
>
> *detecting, without a wafer in the chamber, a light emission of the plasma inside the chamber, and*
>
> *analyzing the light emission to identify the presence of the at least one predetermined compound having been generated from a reaction with at least one air constituent in the chamber from an air leak into the chamber.*

Accordingly, the Applicants suggest that the rejection of claim 32 as being unpatentable over Singh and in light of Levinstein and Kyotani, as applied to claims 1-9, 11-21, 23-31, and 33 above, and further in view of Powell has been overcome and should be withdrawn.

Accordingly, in view of the remarks above, in view of the amendments to claims 1, 13, 25, and 29, and because Singh individually or in combination with Levinstein, and/or Kyotani, and/or Zajac, and/or Sui, and/or Powell do not teach, anticipate, or suggest the presently claimed invention, the Applicants believe that the rejection of claims 1-9, 11-21 and 23-33 under 35 U.S.C. §103(a) has been overcome. The Examiner should withdraw the rejections of these claims.

Conclusion

The foregoing is submitted as full and complete response to the Office Action mailed September 20, 2007. It is believed that the application is now in condition for allowance. Allowance of claims 1-9, 11-21, and 23-31, and 33 is respectfully requested.

No amendment made was related to the statutory requirements of patentability unless expressly stated herein. No amendment made was for the purpose of narrowing the scope of any claim, unless the Applicants have argued herein that such amendment was made to distinguish over a particular reference or combination of references.

The Applicants acknowledge the continuing duty of candor and good faith in the disclosure of information known to be material to the examination of this application. In accordance with 37 CFR §1.56, all such information is dutifully made of record. The foreseeable equivalents of any territory surrendered by amendment is limited to the territory taught by the information of record. No other territory afforded by the doctrine of equivalents is knowingly surrendered and everything else is unforeseeable at the time of this amendment by the Applicants and their attorneys.

The present application, after entry of this Response, comprises thirty (30) claims, including four (4) independent claims. The Applicants have previously paid for thirty-one (31) claims including four (4) independent claims. The Applicants, therefore, believe that a fee for claims amendment is currently not due.

The Commissioner is hereby authorized to charge any fees that may be required or credit any overpayment to Deposit Account No. **50-1556**.

PLEASE CALL the undersigned attorney at (561) 989-9811, should the Examiner believe a telephone interview would help advance prosecution of the application.

Respectfully submitted,

Date: November 20, 2007

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